

Biological Waste Segregation Guideline

Introduction

Segregation, proper identification, and proper packaging allow for the safe and environmentally responsible disposal of hazardous biological wastes.

General Rules for the Handling and Disposal of Biological Wastes

When generating and disposing of wastes, use the following guidelines:

1. SEGREGATE biological wastes based on the segregation flowchart in this guideline.
2. LABEL all waste containers with the following information
 - a. Contents
 - i. Write the full name of the chemical, percentages and/or concentration
 - ii. Short forms can be included, but not solely used
 - b. Approximate concentration of each component
 - c. Name of the generator
 - d. Lab location and extension
3. ENSURE the containers you use are compatible with the wastes you put in them. A Chemical Compatibility guidance document can be accessed by opening this <https://tools.thermofisher.com/content/sfs/brochures/D20480.pdf>.
4. CLEAN containers are accepted at waste pick-ups. Bottles or containers with residues on the outside will not be accepted.

Waste Segregation and Disinfection

The flowchart below provides a summary of how biological waste is to be segregated.

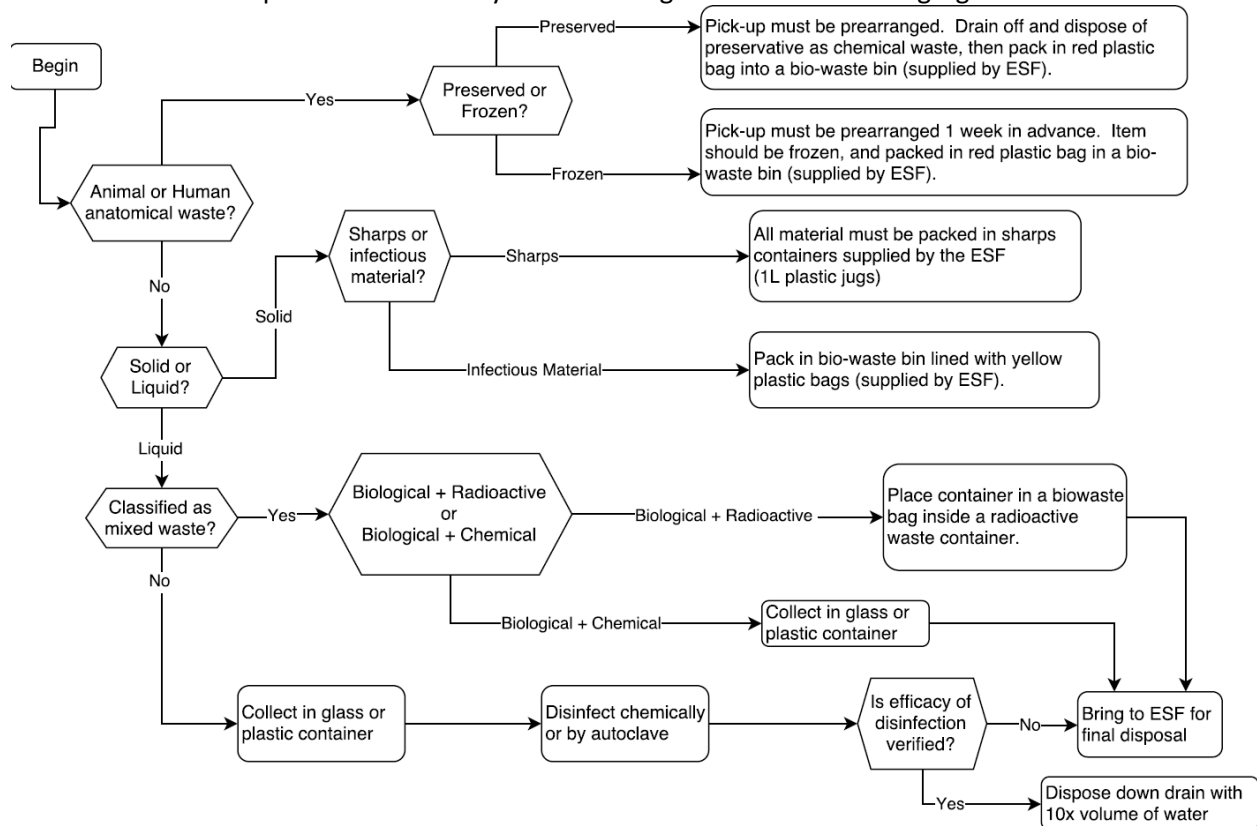


Figure 1: Flowchart defining how biological wastes are segregated and disposed of.



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If after reviewing the flowchart, you are unsure how to classify your waste, please contact Greg Friday at extension 35755.

Flowchart Details:

Solid Biological Wastes

Solid biological wastes consist of materials such as gloves, labcoats, paper towels, petri dishes, centrifuge tubes, etc... contaminated with biological wastes. Agar should be allowed to solidify then be treated as solid waste.

At the University of Waterloo, all waste collected in the bio-waste bins lined with yellow bags are sent to Steri-cycle for final sterilization and disposal.

Liquid Biological Wastes

Liquid biological wastes include used nutrient broths, cell cultures, blood and bodily fluids (animal and human), recombinant or synthetic nucleic acids, and liquids contaminated with these materials.

Most liquid biological wastes can be deactivated physically or chemically.

Chemical Disinfection:

- The appropriate chemical is specific to the active agent. Some considerations include:
 - Presence of organic materials
 - Contact time
 - Concentration
 - Chemical preparation frequency is vital – as materials like bleach and hydrogen peroxide rapidly lose efficacy once exposed to air
 - Compatibility of surfaces or materials with the chemical being used
- Please review the Chemical Disinfection Guidance prior to chemically disinfecting your liquid biological waste. https://uwaterloo.ca/safety-office/sites/ca.safety-office/files/uploads/files/a_guide_to_the_development_of_laboratory_chemical_disinfection_protocols_-_june_-_05_-2017.pdf

Physical Inactivation (Autoclaving):

- Involves exposing the material to elevated temperatures and pressures for a specific amount of time. Some considerations include:
 - There are both dry and wet techniques
 - Temperatures, pressures, and cycle times are vital to successful inactivation
 - Positioning in autoclave is also an important
 - Must verify efficacy of inactivation using accepted methods
- Please review the Autoclave Guidance and ensure the user is trained on the specific operating procedures of the Autoclave that is to be used. The Autoclave Guidance document is located on this webpage: <https://uwaterloo.ca/safety-office/sites/ca.safety-office/files/uploads/files/guideline-for-safe-use-of-autoclaves.pdf>

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Packaging

Liquid wastes (blood, bodily fluids, and potentially pathogenic materials)

1. Collect in a 1 L or 4 L container
2. Fill container only 70% - 80% of the total volume
3. Bring to ESF for final disposal

In Laboratory Treatment and Disposal of Liquid Wastes

Should the laboratory wish to dispose of these materials down the drain, the following protocols must be followed:

1) For Blood and Bodily Fluids:

- a) Use an appropriate disinfectant. Bleach should only be used if disposal is occurring the same day, because after 24 hours bleach loses its efficacy. If you don't intend on disposal for the same day of generation, use another disinfectant that is stable over a longer period of time.
- b) Remember to MAINTAIN the minimum concentration for inactivation. If Bleach is used, a 1 to 10 ratio of Bleach to liquid ratio should be maintained in the container – meaning if you add more material, then more Bleach needs to also be added.
- c) Bleach should be prepared fresh on the day of use.
- d) Let sit for a minimum of 30 minutes prior to disposal.
- e) Perform ***Efficacy Monitoring***

2) For Potentially Pathogenic Materials:

- a) Determine and document which disinfectant you will be using. If you need assistance in determining which disinfectant to use, please review our Chemical Disinfection Guide to which a link is located above in the chemical disinfection section.
- b) Prepare the disinfectant fresh on the day you will be using it.
- c) Ensure that the final concentration in the container is appropriate to achieve inactivation. Remember, anytime you add more waste, you must also increase the amount of disinfectant to maintain the minimum concentration to achieve inactivation.
- d) Ensure the contact time for the waste is achieved.
- e) Perform ***Efficacy Monitoring***

Efficacy Monitoring is proving that your inactivation method is effective. It requires proof that what was done to inactivate the material was successful, and these efforts must be documented.. In other words, you must periodically try to plate your treated liquid waste. If nothing grows your treatment is successful. If you cannot perform efficacy monitoring, collect your waste and send it to the ESF for final disposal. Contact the Safety Office for guidance.

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Solid waste contaminated with Infectious Materials (medical waste, infectious materials, cultures etc.)

- All material must be packed in biohazard bins with liners supplied by the ESF.
- Bags inside bins must be sealed (tied) and lid secured.
- Bin must not be over packed (14kg max).



Figure 2: Image of the UW's biowaste bins.

Sharps (syringes, blades etc. contaminated with bio hazardous materials)

- All material must be packed in sharps containers supplied by the ESF (1L Plastic Jugs).

Animal Frozen

- All animals are to be kept frozen by researcher.
- Pick up must be arranged in advance. Call Greg Friday at ext. 35755 for schedule.
- All material must be packed in biohazard bags supplied by the ESF.

Animal Preserved

- All formalin must be drained off and disposed of as chemical waste.
- All material must be packed in biohazard bins with liners supplied by the ESF.
- Bags inside bins must be sealed (tied) and lid secured.
- Bin must not be over packed (14kg max).